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Grate for a boiler for solid fuels

The invention refers to a grate for a boiler for solid fuels, in particular for central heatings, with a fixed Rostbett with several oblong passage openings for the ash and/or. Slag, which is arcuate arranged around a common center, and also in the passage openings arranged shaking pin, whose is each in the longitudinal direction of its passage opening movable and hiezu with an pin-inertial connected arranged underneath the Rostbettes, which is more movable by means of a linkage around the common center more rotatable and, whereby the standing shaking pins with their upper free ends manage upward over the top surface of the Rostbettes.

In the operation of a boiler for solid fuels collects themselves an ash and/or on the Rostbett. Heap of cinder, that mostly with a Schürhaken od.dgl. cut up and distributed becomes, so that then smaller Aschebzw. Cinder particle by the rust openings downward into an ash drawer od.dgl. to fall can. Hiezu the necessary work is frequent troublesome and presupposes that the grate is corresponding accessible from the outside, in order to be able to serve the Schürhaken.

There is also so called shaking rust known, with which the Rostbett can be shaken as whole or at least a majority of the same from the outside by means of a linkage. There the Rostbett, in particular with larger furnaces, one relatively large mass has, is also this work troublesome, particularly also ash located at the Rostbett and/or. Cinder mass along-moved will must. The Rüttelbewegung of the Rostbettes is frequent also for liners from ceramic material, in particular refractory clay, of harmful influence, planned in the region of the combustion chamber.

With a grate of the initially described kind (DE-A 83,363) these disadvantages are avoided by the shaking pins movable in the passage openings around the common center. With this known construction sit all shaking pin on a common pin-inertial, which must become raised before the introduction of the actual Rüttelbewegung first by withdrawal of a control rod, before can become performed by swivelling of the same control rod the Rüttelbewegung.

This has different disadvantages: First that has provided pin-inertial with the shaking pins with larger furnace types significant dimensions, which brings technical difficulties with itself. The elevation of the pin carrier with the shaking pins is often not problem-free possible, there at least a part of the clinkering located at the grate and/or. Glow bed to be lifted must. Further the achievement of one presupposes genügendelRüttelwir kung the turning of the bar around a great angular range, which a corresponding large opening in the side wall of the Wens underneath the Rostbettes conditional. By this opening can air unobstructed the bottom grate influxes, which the control of the burn-up affected.

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Finally the execution of the Rüttelbewegung is troublesome because the bar must become withdrawn with and the Herverschwenkung from the furnace at the same time, in order to avoid that becomes pin-inertial with this pivotal movement that again lowered.

The invention sits down to the object to avoid these disadvantages and to simplify both the production of the components required for the Rüttelbewegung to facilitate and the operation of the shaking device. The invention solves this object dadurch1 that the common center adjacent shaking pins and from this center of other remote shaking pins at from each other separate, one above the other and in height direction non-relocatable arranged pin carriers arranged is, which pin-inertial with a common control rod of the linkage for the Rüttelbewegung is connected, which is eccentric connected articulated with the pin carriers. Such a construction protects those the last described state of the art of own advantages that the entire grate does not have to become for achievement of the Rüttelbewegung moved, which means a indulgence of the impactsensitive liners planned in the combustion chamber, however becomes beyond that by the division of the shaking pins on two pin-inertial the production that pin-inertial, in particular with larger boiler cross sections, substantial facilitated. Above all however do not have these pin-inertial any longer raised to become, in order to be able to exercise an effective Rüttelbewegung, but they become only pivoted, by means of the common control rod, in an horizontal plane around the common center, the control rod serves therefore only for the turning that shake-pin-inertial and does not have to become any longer the elevation the same from the furnace withdrawn. The shaking pins are always operative therefore. The articulated connection of the control rod with the pin carriers possible it to essentially obtain the Rüttelbewegung by a mere Bewe gung the

control rod in their longitudinal direction so that this bar light sealed in the boiler wall, guided becomes and thus the supply of incorrect air avoided can become.

The shaking pins must manage only slight one upward with their upper free ends over the top surface of the Rostbettes. Hiezu is sufficient a fraction of the length of the passage openings, for about 1/10 to 1/2 of this length, measured in depressing direction, preferably 1/6 to 1/3 this length. This is sufficient for the practice of an effective shock loading on the slag located at the grate and/or. Ash fill.

Preferably the shaking pins of circular cylindrical pin formed, which itself in, are according to invention, which moves passage openings formed slots of the Rostbettes, which slots extend downward. The circular cylindrical form of the pins brings on the one hand the advantage that cheap from bar material made offers these pins to become to be able, on the other hand the circular cylindrical form the smallest beginning possibility for adherent clinkering and/or. Ash parts. Cannot come therefore to a blockage of the pins entling the longitudinal direction of the passage openings, particularly itself downward the extending passage openings falling through ash and/or. Cinder particles favour, as soon as these particles occurred once the passage openings.

In accordance with a development of the invention a those can be more rotatable the common center adjacent shaking pin supporting pin-inertial around the center by means of a vertical pivot pin fixed at the Rostbett, whereby around the same pivot pin an other pin-inertial arranged below this pin carrier is more rotatable, which remote shaking pins other of the center carries. This particularly results in one simple construction with a particularly simple turning storage for the two pin-inertial, which can be manufactured. This turning storage formed of the pivot pin can become also in accordance with a development of the invention utilized to plan at the upper end of this pivot pin upward an hook or a ring managing of the Rostbett with which the grate or at least a part of the same can become raised in the charge well upward, e.g. for repair or cleaning.

In accordance with an execution variant of the invention however also the arrangement can be so met that at least an pin-inertial is rotatable guided by means of the shaking pins slidable in the passage openings around the common center, whereby this carries pin-inertial the shaking pins by means of one in itself closed ring.

In the drawing an embodiment of the invention is schematically illustrated. Fig.1 shows a grate used into a boiler in the vertical section. Fig.2 points this grate in larger yardstick and Fig.3 is a plan view to Fig.2.

In Fig.1 a boiler for a central heating is shown, which has a standing charge well 1 with circular cross-section, which is down 2 completed by a grate. The charge well 1 is by a lid 3 dense lockable above, which carries an used sediment bowl 4 for the observation of the burn-up and a handle 5, with which the lid 3 around the axle of a hinge 6 be opened unfold can. The charge well 1 is of a water-leading inner shell 7-mit annular section surrounded, which is of a likewise water-leading outer shell 8, likewise with annular section, surrounded, whereby however between the two jackets 7.8 an annular gap exists, in which a flue gas channel 9 arranged is. The inner shell 7 and the outer shell 8 stand with one another over radial pipes 10 arranged regarding the longitudinal axis of the charge well 1 in connection. To the outer shell 8 is above over an all around longitudinal distribution channel 11 a return connecting piece 12 for the heating water of the central heating plant connected. In analogous manner an all around longitudinal main sewer is 13 arranged at the upper end of the gutter coat 7, is 14 connected to which the flue gas channel 9 interspersing advance connecting piece. In, the bottom wall 15 of the distribution channel 1 and/or.

the main sewer 13 a plurality of orifices is 16 provided, by which the water, in circumferential direction of the duct 11 bzw.13 distributed, into the outer shell 8 and/or. out of the inner shell 7 to flow can. In analogous manner are at the inner shell 7 and/or. at the outer shell of 8 down annular distribution channels 11 provided, which by the radial pipes 10 among themselves connected are and are provided at their top walls 17 with openings 18 for the passage of the water.

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The flue gas channel 9 the flue gases occur by the annular gap 19 remaining between the lid 3 and the upper edge of the inner shell 7. This annular gap a first draft 20 of the flue gas channel 9 follows 19, which runs downward in several gears helical around the inner shell 7 around. An intermediate wall 21 separates this draft 20 from an other draft 22 of the flue gas channel 9, which to the smoke outlet connecting piece 23 leads and stands down with the draft 20 by an all around current opening 24 in connection. Also the draft 22 has several helical 20 gears longitudinal around the first mentioned draft, which lead from downside upward however. The direction of flow of the flue gases led in these drafts 20.22 is 25 indicated by arrows, the direction of flow of the water flowing in the jackets 7.8 by arrows 26. Die direction of flow of the water is always therefore in the counterflow for flue gas current in the adjacent draft 20 bzw.22 of the flue gas channel 9. The single helical longitudinal gears of the two drafts 20.22 are limited of oblique walls 27 from sheet, which from the inside outward inclined is and releases in each case outer a narrow gap, by which fly ash into the underlying in each case gear of the respective draft 20 bzw.22 fall through can. These fly ash particles arrive finally at to the common bottom wall 28 of the two drafts 20.22. In of this bottom wall 28 are between two each other adjacent pipes 10 an opening, is 29 connected to which a duct, by which the fly ash at an injector nozzle 30 guided will, which is in a venturi tube 31 arranged, by which from a not represented fan air toward the arrows 32 into the ash area 33 blown located underneath the grate 2 becomes, from where the air by the grate 2 into the charge well 1 arrived.

The fly ash particles from the drafts 20.22 are pulled out by the suction of this flow of air. The intermediate wall 21 and the oblique walls 27 form a Zyklongeschränk, which between the inner shell 7 and the outer shell 8 used and

convenient for cleaning and easier assembly from above are into the annular space used existing between the two jackets 7.8. In order to facilitate this, this Zyklongeschränk can be in circumferential direction of the charge well 1 into individual segments divided, overlap itself their walls, in order to avoid leaky places.

At the distribution channels 11 and/or. the main sewer 13 the bottom walls 15 must and/or. the top wall 17 not necessarily provided with openings 16 bzw. 18 its. It is also possible, the sheet of these bottom walls 15 and/or. To cut top walls 17 narrower as the channel width and only single, either outer or inside, at the sheet of the inner shell 7 and/or. Outer shell 8 festzuschweissen.

The grate 2 rests upon inward a flange 34 rising up of the wall of the charge well and has a Rostbett 35, a variety of arcuate longitudinal oblong passage openings 36 for the ash and/or. Slag has, which run regarding a common center 37 concentric. Each passage opening 36 extended itself from above downward, whereby the cross section is approximate trapezoidal. This the facilitated passage of ash parts. In each passage opening 36 a shaking pin is 38 arranged, which is in longitudinal direction of the associated passage opening 36 movable. Hiezu are the shaking pins 38 with two 35 pin carriers 39.40 connected arranged underneath the Rostbettes, whereby that is appropriate for pin-inertial 39 above the pin carrier 40 and those 37 adjacent shaking pins 38 for the center carries, against what that carries deep arranged pin-inertial 40 the remote shaking pins 38 other of the center 37. The two pin-inertial 39.40 are 41 pivotably mounted around a common vertical axis. Hiezu carries the Rostbett 35 in the center 37 a bolzenförmigen pivot pin 42, on which the two pin-inertial 39.40 one above the other pivotable fitted free with central bores 43 bzw. 44 are. Each pin-inertial 39.40 has star shaped arranged arms 45 bzw. 46, which upward shaking pins 38 inertial rising up of these arms.

Additional one hiezu has the lower, larger pin-inertial 40 in the region of the ends of its arms 46 arcuate longitudinal approaches 47 (Fig.3), which other shaking pins 38 inertial. All shaking pins 38 are formed of circular cylindrical pins, whose diameter is somewhat smaller than the smallest width each passage opening 36, so that the shaking pins 38 have sufficient clearance, in order to be able to move in the passage openings 36. As the Fig.1 and 2 show, the shaking pins 38 with their upper free ends 48 tower above the level of the top surface 49 of the Rostbettes 35, whereby ensured is that when shaking the shaking pins 48 regarding fixed grate will fall the bed 35 the slag destroyed formed in the glow bed itself and by the passage openings 36 of the grate 2 can. The top surface 49 can be hiebei just like the ends 48 the shaking pin 38 by the center 37 outward inclined, in order to lead the glow bed of the center 37 away to the peripheral portions of the grate 2, where the Rüttelbe is stronger waoung the shaking pin 38 as in the center 37 adjacent areas.

For execution a linkage 50, which has a control rod 51, serves the Rüttelbewegung, which is more actuatable from the ash area 33 by the frame of the boiler outward guided and by means of a handle 52. This bar 51 is articulated mexcentric ncaedneten fen and by a split pin 54 approximately refuse of this pin 53 secured. The pin 53 stands for a penetrated bearing centre 55 of the lower pin carrier 40 downward from the underside of the upper pin carrier 39 away and, so that also this is carried forward with a moving of the bar 51 back and forth for Rüttelbewegung. The bar 51 is 39.40 connected regarding the common center of rotation 37 lateral eccentric with the two pin carriers.

That the pivot axis 42 39.40 bolts formed for the two pin-inertial has a ring 56 managing upward of the Rostbett 35 at its upper end, with which the entire grate is lift outable 2 after loosening of the split pin 54 raisable and from the charge well 1. This facilitated assembly and cleaning of the grate 2.

The lower pin-inertial 40 has an approach 57 managing upward in the middle, so that the upper pin-inertial 39 up-resting on this approach 57 40 something raised opposite the main part of the lower pin carrier is.

Of course the shaking pins can be 38 also at more than two pin carriers provided.

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Increases the length the passage openings 36 measured in circumferential direction of the grate 2 toward of the center 37 against the circumference of the Rostbettes 35, whereby the arrangement convenient is so met that during the Rüttelbewegung all shaking pins 38 reach essentially at the same time the end of their respective passage opening 36 serving as limiting stop, so that the whole length of the passage opening 36 is free-deseamed. With very prolonged passage openings it would be more conceivable to plan per average opening also more than one shaking pin.

With great units it is more favorable to avoid a central turning storage for those pin-inertial 39.40 and those pin-inertial without such a central storage, however annular continuous to train. Each pin inertial ring becomes hiebei 38 centered by means of the shaking pins, which slide in the concentric passage openings formed to the center of rotation and become by these guided.